



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/616,716	07/10/2003	Momoc Adachi	09792909-5650	2623

26263 7590 12/28/2007
SONNENSCHN NATH & ROSENTHAL LLP
P.O. BOX 061080
WACKER DRIVE STATION, SEARS TOWER
CHICAGO, IL 60606-1080

EXAMINER

LEE, CYNTHIA K

ART UNIT	PAPER NUMBER
----------	--------------

1795

MAIL DATE	DELIVERY MODE
-----------	---------------

12/28/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/616,716

Applicant(s)

ADACHI ET AL.

Examiner

Cynthia Lee

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 October 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 7-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 7-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This Office Action is responsive to the amendment filed on 10/15/2007. Claims 1-5 and 7-20 are pending.

Applicant's prior art arguments have been fully considered and are persuasive. However, upon further consideration, the instant claims are rejected under new grounds of rejections and thus, claims 1-5 and 7-20 are finally rejected for reasons stated herein below.

The Claims Objection is withdrawn.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5, 7-11, 13-16, 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawakami (US 6949312) in view of Fujita (WO 01/22519) (equivalent document US 6884546 relied upon for English translation) and Iwamoto (WO00/33403) (equivalent document US 6824920 relied upon for English translation).

Kawakami discloses a battery comprising a cathode, an anode, and an electrolyte. The negative and positive electrodes are capable of intercalating and de-intercalating lithium (applicant's light metal). The anode further contains graphite (applicant's claims 7, 8, and 9) (28:35). The anode further contains tin (applicant's

claims 10 and 11) (27:58). The electrolyte contains LiBF_4 , (applicant's claim 15) (29:21). The battery was made to be of an anode capacity-controlled type in that the cathode capacity was made to be larger than the anode capacity (applicant's claim 1) (29:52-55).

Kawakami does not disclose that the light metal is deposited on the anode at an open circuit voltage lower than overcharge voltage (instant claim 1). Iwamoto does not disclose a battery wherein a ratio A/B is at least 0.05 to at most 3, A being the capacity component obtained by deposition and dissolution of light metal and B being the capacity component obtained by insertion and extraction of light metal (instant claim 20). However, Fujita teaches a negative electrode containing negative electrode material capable of occluding/releasing lithium in an ionic state and thereby, lithium metal precipitates (applicant's deposition and dissolution) in the negative electrode in a state where the open circuit voltage is lower than the overcharge voltage. In other words, lithium is occluded in an ionic state in a negative electrode material capable of occluding/releasing lithium in the beginning of charging and then lithium metal precipitates on the surface of the negative electrode material thereafter during charging. The amount of precipitation of lithium metal is preferable to be from 0.05 to 3.0 times, both inclusive, the ability of charging capacity of the negative electrode material capable of occluding/releasing lithium. Thereby, high energy density and an excellent cycle characteristic can be obtained. See Abstract and 17:65-18:30, 19:37-45. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made

to modify Kawakami's battery with the teachings of Fujita for the benefit of improving the overall performance of the battery by depositing lithium after charging.

Kawakami modified by Fujita does not teach the electrolyte containing a light metal salt having a M-O bond (applicant's claims 1-3 and 5). Iwamoto teaches that the electrolyte contains bis(1,2-benzene diolate(2-)-O,O')lithium borate (applicant's claims 1-4). It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute Kawakami's LiBF_4 , for Iwamoto's bis(1,2-benzene diolate(2-)-O,O')lithium borate because they are art recognized equivalents as ionic conductive compounds in a lithium battery electrolyte. See MPEP 2144.06. It has been held by the court that the selection of a known material based on its suitability for its intended use is *prima facie* obvious. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). See MPEP 2144.07.

Kawakami modified by Fujita does not teach the electrolyte containing LiPF_6 , $\text{LiN}(\text{CF}_3\text{SO}_2)_2$, $\text{LiN}(\text{C}_2\text{F}_5\text{SO}_2)_2$, and LiClO_4 (applicant's claims 13 and 15-18). Iwamoto teaches an electrolyte containing LiPF_6 , $\text{LiN}(\text{CF}_3\text{SO}_2)_2$, $\text{LiN}(\text{C}_2\text{F}_5\text{SO}_2)_2$, $\text{LiC}(\text{CF}_3\text{SO}_2)_3$, and LiClO_4 (9:50-55). It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute Kawakami's LiBF_4 , for Iwamoto's lithium compounds because they are art recognized equivalents as ionic conductive compounds in a lithium battery electrolyte. See MPEP 2144.06. It has been held by the court that the selection of a known material based on its suitability for its intended use is *prima facie* obvious. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). See MPEP 2144.07.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawakami (US 6949312) in view of Fujita (WO 01/22519) (equivalent document US 6884546 relied upon for English translation) and Iwamoto (WO00/33403) (equivalent document US 6824920 relied upon for English translation) as applied to claim 1, further in view of Morigaki (US 2002/0061448).

Kawakami modified by Fujita does not teach the electrolyte contains a polymeric compound. Morigaki teaches a lithium polymer battery in which a host polymer retains the liquid organic electrolyte (abstract). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a polymer electrolyte instead of a liquid electrolyte for the benefit of avoiding electrolyte leakage.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawakami (US 6949312) in view of Fujita (WO 01/22519) (equivalent document US 6884546 relied upon for English translation) and Iwamoto (WO00/33403) (equivalent document US 6824920 relied upon for English translation) as applied to claim 1, further in view of Yoshioka (US 2001/0005558).

Kawakami modified by Fujita does not teach an electrolyte containing $\text{LiC}(\text{CF}_3\text{SO}_2)_3$. Yoshioka teaches an electrolyte containing $\text{LiC}(\text{CF}_3\text{SO}_2)_3$ [0054]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute Kawakami's LiBF_4 , for Yoshioka's lithium compounds because they

are art recognized equivalents as ionic conductive compounds in a lithium battery electrolyte. See MPEP 2144.06. It has been held by the court that the selection of a known material based on its suitability for its intended use is *prima facie* obvious. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). See MPEP 2144.07.

Response to Arguments

Applicant's arguments filed 10/15/2007 have been fully considered but they are not persuasive.

Applicant asserts that Iwamoto in view of Fujita fails to disclose or suggest Applicant's claimed ratio X/Y that is at least 0.05 to at most 3.0, in which X is a capacity component obtained by deposition and dissolution of a light metal and Y is a capacity component obtained by insertion and extraction of the light metal.

In response to Applicant's arguments, 37 CFR 1.111(b) states, "A general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references does not comply with the requirements of the section." Applicant has failed to specifically point out how the language of the claims patentably distinguishes them from the references.

All of applicants' presently filed arguments are only statements with no evidentiary support as to why the art rejections of record do not meet all the claimed

limitations. Applicants have not specifically pointed out the errors of the Examiner's art rejections.

Applicant must discuss the references applied against the claims, explaining how the claims avoid the references or distinguish from them.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia Lee whose telephone number is 571-272-8699. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

Application/Control Number:
10/616,716
Art Unit: 1795

Page 8


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Susy Tsang-Foster can be reached on 571-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ckl

Cynthia Lee

Patent Examiner



RAYMOND ALEJANDRO
PRIMARY EXAMINER